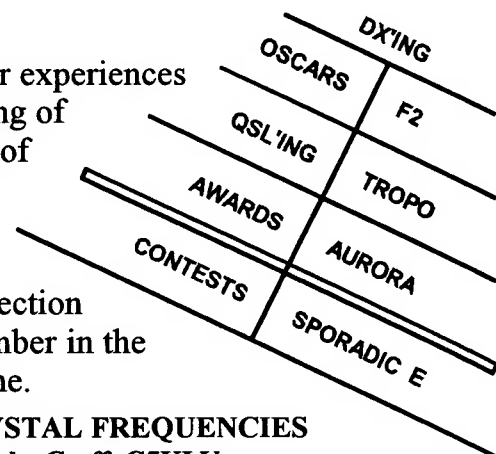




## THE SEPTEMBER MEETING - Aspects of VHF

This month Ela, G6HKM will provide members with a synopsis of her experiences in Amateur Radio over the past thirteen years, from the humble beginning of just wanting to say a few words over the air to her present status as one of the leading VHF operators in the UK.

Assisted by Roy, G3PMX, Ela will describe some of the modes of transmission used to achieve long distance communication on VHF and will illustrate these with some interesting sound clips, from her collection of tape recordings. The meeting opens at 7.30pm on Tuesday 5<sup>th</sup> September in the Marconi College, Arbour Lane, Chelmsford. Guests are always welcome.



### DATES FOR YOUR DIARY

- 5 Sep. CLUB MEETING - Aspects of VHF - Ela G6HKM.
- 9/10 Sep. RSGB HF CONVENTION - Nearby Windsor.
- 10 Sep. SOUTHEND & DRS RALLY - New Venue!
- 10 Sep. BARTG RALLY - Sandown Park, Esher, Surrey.
- 24 Sep. HARLOW AR & COMPUTER SHOW - Sports Centre.
- 3 Oct. CLUB MEETING - Annual General Meeting.

### C.A.R.S. ANNUAL AWARD

At the October AGM our Society Award of Merit will be presented to a member who has made a substantial achievement in the field of Amateur Radio during the past year.

Nominations should be made in writing and given or sent to a committee member.

Voting slips bearing the names of the nominees will be circulated during the AGM.

### MEMBERS NEWS - Ela, G6HKM

This month we welcome our second overseas member Alois Ochojski, DL3PD, Alois lives in Backnang (twinned with Chelmsford) and has a regular sked on 40M every Tuesday with Roy G3PMX, Harry G5HF and occasionally one or two other members. Alois is retired and is a great constructor of amateur radio equipment.

Congratulations go to Jan Swanwick who has passed the R.A.E. and is the proud owner of G7UVP.

### THE 1995 ANNUAL GENERAL MEETING

Although this event is still some weeks away, we request that members give some thought to nominations for the next committee.

Three members of the present committee have given early notice that, for various reasons, they wish to stand down at the AGM and not be considered for re-election.

### COMMITTEE MEETING

The next Committee meeting will be held at 7.30pm on Wednesday 13<sup>th</sup> September, in Telford Lodge, you are welcome to join us.

### DIGITAL AUDIO BROADCASTING - Dick, G3WHR

On the 27<sup>th</sup> September the BBC will begin transmitting its programs in a digital format using frequencies in the old TV Band III between 216 and 230 MHz.

Transmitters have been installed at five sites around London, the nearest to Chelmsford being Alexandra Palace and Bluebell Hill.

The big problem in receiving the DAB service is the shortage of receivers, and their cost.

### ALTERING CRYSTAL FREQUENCIES

A Technical Article by Geoff, G7KLV

As anyone who has ever listened to the '21 NET' in the morning will know, it is a veritable encyclopaedia of useful and interesting information! Ever hopeful I ventured in seeking advice about grinding quartz crystals to a different frequency. Lo and behold the answers came back thick and fast, and all useful I may add! Three of the regulars (Tom, Ralph and Stan) and G2OR soon had my problem sorted, together with offers of the necessary materials. It occurred to me that others might be interested and, perhaps, younger members who might not be familiar with the process. Apparently it was quite common thirty or so years ago when crystals were relatively expensive.

The frequency of a quartz crystal is determined primarily by its thickness. The thinner it is, the higher the frequency. So, to start with you have to find a crystal whose frequency is lower than the desired final frequency. Modern crystals are not suitable because the plate connections are made by a delicate soldering process. I have acquired a collection of the older types of crystals of various types. They can often be found at rallies for pence. The connections are metal plates under gentle compression allowing the quartz to be removed easily. The quartz is usually about ½ inch square and is quite easily worked.

Various methods were suggested using Vim, or Ajax, Carborundum grinding paste and Brasso as abrasives on a piece of plate glass. I don't know if valve grinding paste is still available from such as Halfords but I had some and tried it without success. The crystal refused to oscillate afterwards! After a bit more cautious trial and error I obtained good results using a Carborundum stone lubricated with Brasso. Ideally the stone should be new and true. Place the piece of quartz on the stone with a drop or so of Brasso and gently rub it using the fore finger keeping a steady pressure. Start with the coarse side of the stone, then finish on the fine side. I also used a Turkey stone, which is very fine, for the final adjustment.

Take it in easy stages. It is absolutely essential to wash the plate using detergent after each grind; it is a tedious process but can be done with patience. Check the frequency after each grind remembering to clean it thoroughly; a crystal oscillates at a slightly lower frequency when it is dirty so you can be caught out when approaching final frequency if you are not careful. Obviously one must have a suitable test circuit tailored to the crystal under test. Before you start grinding make sure it starts readily over a range of supply voltages. Set the frequency adjustment to mid-way.

Using the above method I was able to increase the frequency of a 2016 kHz crystal to 2133.3 kHz for use as a reference in the RadCom synthesiser for ex-PMR equipment.

I wonder if anyone knows how to alter the frequency of modern crystals?

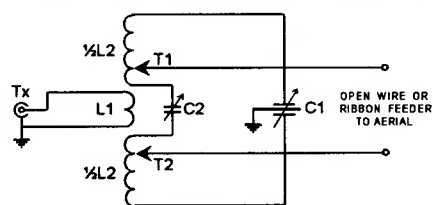
## LAST MONTHS MEETING - Harry G5HF

Most radio amateurs associate Louis Varney (G5RV) with aerials and for his 1995 talk he covered three practical solutions to interesting problems, although we must not forget he has designed and built transmitters as well as operated (and still does) CW DX almost daily for over 60 years.

The first problem concerned the difficulty some amateurs have in getting a low SWR at the station end of the feeder. This usually arises on only one band, the other bands giving a normally low SWR. Louis believes that this is caused by resonance of the aerial and feeder system at an odd  $1/8\lambda$  along the feeder and computer analysis by G0APZ (Len) confirmed this theory by showing that at  $1/4$  and  $1/2\lambda$  and multiples of these electrical lengths along the feeder at 14MHz the reactance was zero, whereas at  $1/8$ ,  $3/8$  and  $5/8\lambda$  from one end the reactance was about 582 ohms (plus or minus, depending on which eighth was involved).

If by chance the feeder terminates at an odd  $1/8\lambda$  a normal ASTU will not give a good match at the transmitter end of the feeder unless the feeder is shortened or lengthened by a few feet and this is a simple solution to the problem.

Louis next described an ASTU design which was very effective and the circuit is given in the diagram. In this circuit C1 is a



transmitter type split-stator capacitor of, typically, 150pF per section and C2 is a receiver type 3-gang 500pF per section variable capacitor, with the sections connected in parallel. This capacitor functions as a vernier loading control in connection with the feeder taps T1 and T2, selected by trial and error, on L2 to give the best VSWR at the transmitter output.

The third part of the talk was the description of a vertical helical aerial for Top Band and 80 metres which normally require a very long high wire. In view of the difficulty many of us have in erecting such an aerial and the interest in the lower frequency bands on account of the present Sunspot minimum, the vertical helical has a great deal to offer.

Louis showed a half size aerial made up in about 3 hours on the morning of the lecture and this consisted of two lengths of plastic water tube totalling 10ft long and wound with 16g tinned copper wire, about 4 turns per inch. The objective is to wind on as much wire as possible to achieve a "long wire" but it must not be wound closer than about 4 turns per inch if it is to radiate as an aerial. The total length of wire on the tube was 82ft and this was connected to the transmitter by a further 44ft of wire about 4ft above ground. The aerial itself was mounted with the lower end about 2ft above ground and subsequent tests enabled Louis to have an excellent CW QSO with F5HY/P near Bordeaux. At 100 watts the report of 5.7.9. was considered excellent on 3.5MHz.

A full size aerial would be about 20ft long, mounted as high as possible. Louis has such an aerial in Burgess Hill and has worked as far as Finland on TOP Band on CW. It should be added that such an aerial must be connected to the Tx via a good ASTU! Also it would be helped by a counterpoise and Louis suggests about ten wires spread out round 360° just above head height so as not to upset the head gardener/station manager/XYL. Better still, lay the wires in 4 inch deep slits in the lawn, using a spade in the dead of night!

During the vote of thanks to Louis, Harry, G5HF recited a short poem he had written in honour of our guest speaker:-

*They said to a fellow called Louis,  
An all-band antenna is screwy.  
So he climbed up a tree with a G5RV  
and he worked all the world, saying phooey.*

## DF NEWS - Dick, G3WHR

### Chelmsford Events.

Peter Graves was the hidden station for the **Second Event**. With only 4 teams you'd think that we would soon be in the pub - but Peter had other plans.

The start bearing went North towards Wakes Colne, so I drove to a position on the A604 near White Colne ready for a second bearing to confirm this. To my amazement, though standing in the middle of an empty field, I was unable to obtain a bearing on the second transmission. It may have been proximity to power lines, but the DF set would not null in any direction. There was little I could do except go to the opposite side of my start bearing and try again. This time I got a direction, but it wasn't a good one - the cross was in an area of empty fields. More time went by and the map became black with bearings before I settled on the railway viaduct.

The other teams were waiting for me when I drove up. There's only one footpath down the side of the viaduct so I was confident of finding Peter fairly quickly; however, my problems were far from over. I searched every metre of the footpath and found nothing. The receiver battery started to fail, and you all know how quickly nicads give up. Peter kept going after 9pm but I wasn't getting any closer. I fitted my spare battery and tried again - by this time Peter was understandably ready for some refreshment, and gave some clear instructions on how to find the right side of the railway. Only then was I able to find my way to the transmitter.

### Results

1	Mike Hawkins	8.20
2	Ian Butson	8.25
3	Tim Parker	8.30
4	Dick Brocks	9.20

For our **Third Event**, Paul Beards had volunteered to be the hidden station. This time there were nine teams at the start. Paul lives near Brightlingsea, so we weren't surprised when the start bearing went that way. I drove towards Colchester and just got past the Zoo when I heard the second transmission. The bearing still went towards Brightlingsea but the cross was clearly on the east side of the Colne near Abberton. No messing about this time, I drove straight to the end of the most likely footpath - no DF cars in sight. When the transmitter came on at 8pm it was VERY strong so I ran down the path and hadn't gone very far into the wood when the bearing turned. I was surprised and was attempting to sense the direction when the signal went off.

There were now other teams coming down the path so I stood to one side to let them pass. A little bushbeating brought me to Paul, then back to the path. I wasn't alone for long, on the next transmission just about everybody was in - with teams appearing from all directions, quite a sight.

### Results

1	Dick Brocks	8.09	6	Philip Cunningham	8.13
2	Andrew Mead	8.11	7	Mike Hawkins	8.13
3	Peter Larbalestier	8.12	8	Roy Emeny	8.14
4	Ian Butson	8.12	9	Tim Parker	8.22
5	Peter Graves	8.13			

## HEARD ON THE AIR - Brian, G3CVI

The operator of an HF station made the statement "let me switch off my QRP Linear and see if you get a stronger signal from me"

After a night of gale force winds, the operator of a 2M station was heard to say "I am getting you well on my two and a half element yagi"

73 from Roy & Ela Martyr,  
G3PMX & G6HKM

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